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Design global, manufacture local: operationalizing post-growth industrial policy through cosmolocalism

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Abstract

The resurgence of industrial policy across advanced economies responds to ecological, geopolitical, and socio-economic crises, yet existing frameworks remain contradictory: while seeking resilience, strategic autonomy, and sustainability, they maintain structural dependencies on growth driving ecological overshoot and resource conflicts. Post-growth research proposes transformative alternatives but lacks concrete implementation mechanisms. This article demonstrates how cosmolocalism – circulating knowledge as global commons while maintaining local material production – can help operationalize post-growth industrial policy across three pillars: foundational liveability, peaceful planetary co-existence, and democratically coordinated sustainability. Drawing on evidence from agriculture, energy, and healthcare, we show that differentiating knowledge

and material flows across scales enables innovation without monopoly, productive capacity without resource imperialism, and coordination without centralized control. Applicable to modular, repairable, locally adaptable goods, cosmolocalism bridges post-growth theory and practice while informing spatial policies addressing regional disparities within the EU.
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1. Introduction

Growing ecological, geopolitical, and socio-economic crises have prompted advanced economies to embrace industrial policy once again. The EU's Updated Industrial Strategy (European Commission, 2021) and Green Deal Industrial Plan (European Commission, 2023) exemplify this resurgence, seeking to foster competitiveness, resilience, and sustainability. Yet, as Bärnthaler et al. (2025) demonstrate, current frameworks remain trapped in fundamental contradictions that undermine their stated objectives.

EU industrial policy explicitly seeks Single Market Resilience, but subjects foundational sectors to market logics and liberalization, thereby undermining the very non-market institutions required for social and economic stability. It seeks Strategic Autonomy, but its pursuit of growth-driven security deepens resource dependencies and fuels eco-imperialist tensions, exacerbating the geopolitical instabilities it aims to counteract. It seeks Competitive

Sustainability, but its reliance on private profitability and technological innovation fails to implement 'exnovation' mechanisms, delaying the phase-out of carbon-intensive industries (Bärnthaler et al., 2025). By continuing to prioritize endless economic growth, these approaches perpetuate the ecological overshoot and geopolitical resource tensions they claim to address. The Critical Raw Materials Act (CRMA), for instance, anticipates sharply increased resource consumption requiring extensive expansion of extraction frontiers within and beyond the EU, thereby fuelling the very eco-imperialist tensions that threaten European strategic autonomy (Bärnthaler et al., 2025).

Post-growth scholarship argues that while contemporary capitalist economies are structurally dependent on continuous growth, human prosperity is not inherently tied to economic expansion. Endless growth fundamentally conflicts with planetary boundaries (Hickel, 2020). Bärnthaler et al. (2025) thus propose reorienting industrial policy around three transformative principles: Foundational Liveability (strengthening essential, decommodified provisioning systems), Peaceful Planetary Co-Existence (reducing extractivist and eco-imperialist dependencies), and Democratically Coordinated Sustainability (planning economic transformation through participatory, state-led coordination rather than private, for-profit strategies). Similarly, Hauge and Hickel (2025) advance a progressive framework integrating ecological economics with post-growth principles through scaling down harmful industries, reorganizing production around public benefit, and advancing global ecological justice.

These frameworks redefine success through well-being within planetary boundaries, prioritizing sufficiency over expansion and democratic planning over market governance. The critical challenge, however, is operationalization within existing political-economic constraints. Bärnthaler et al. (2025, p. 14) respond with 'next-best transition steps': a Foundational Economy Strategy that gradually reclaims public control over essential services through

decommodification; a Sufficiency Strategy that systematically reduces Europe's material footprint as a path towards sovereignty, security, and cost savings; and Green Economic Planning, a state-led form of decarbonization coordinating macro-financial architectures to align private capital with strategic public priorities. We perceive these steps as an important contribution to the necessary state-led transformations in policy design, regulation, and macroeconomic coordination. We aim to extend this contribution by engaging with the article's vision of post-growth industrial policy from a complementary perspective grounded in the bottom-up, commons-based production.

A distinction in vantage point is central to our argument. Whereas Bärnthaler et al. (2025) primarily address state-led, top-down policy interventions, our article foregrounds bottom-up, commons-based production practices already operating in the spaces that post-growth industrial policy seeks to transform. Post-growth industrial policy cannot be operationalized through state action alone; it equally requires grassroots infrastructures capable of producing foundational goods outside corporate and market logics. The critical question, which we discuss below, is how these two registers of transformation – state-led coordination and commons-based self-governance – can be articulated without one subsuming the other.

This article argues that cosmolocalism may provide an operational bridge between post-growth theory and practice. In cosmolocal production, designs, software, and technical knowledge circulate globally through digital commons, while manufacturing occurs locally using appropriate technologies and materials (Kostakis et al., 2023; Schismenos et al., 2020). The core analytical claim is that by differentiating what operates globally (knowledge) from what works best locally (manufacturing), cosmolocalism may resolve some contradictions of growth-dependent industrialism, enabling innovation without monopoly, productive capacity without resource imperialism, local autonomy without isolation, and multi-

scale coordination without centralized control.

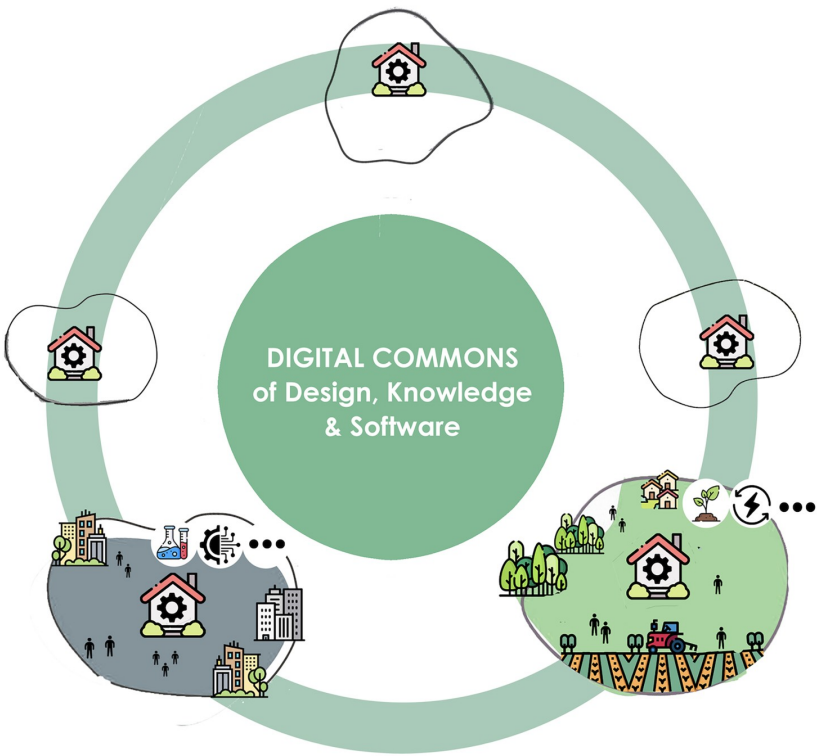
We adopt a theory-driven evidence synthesis approach, using Bärnthaler et al.'s (2025) framework as our guiding foundation. We demonstrate how cosmolocal practices may address the structural contradictions plaguing current industrial policy, providing existing pathways for economic transformation within planetary boundaries. Our analysis integrates action-research insights – one author has been a founding member of four cosmolocal initiatives and conducted extensive fieldwork with the case studies presented here, providing insider access to internal dynamics while acknowledging potential optimistic bias.

2. The cosmolocal reconfiguration

Cosmolocalism reconfigures industrial production by operating knowledge and material flows at different scales, resisting the enclosure and control of both through opening up access (Kostakis & Dalakoglou, 2025; Liodaki & Stockdale, 2025). Designs, blueprints, software, and technical documentation – the 'light' elements – circulate freely through open-source repositories accessible to all under conditions defined by productive communities. Communities worldwide contribute improvements, adaptations, and innovations that benefit the entire network. Manufacturing, however, – the 'heavy' elements – occurs using locally available materials, locally appropriate technologies, and locally controlled facilities: makerspaces, fabrication labs, community workshops. Hence, production responds to place-based needs rather than standardized global markets.

This differs from both traditional local production, which lacks access to broader knowledge networks, and globalized manufacturing, which homogenizes production regardless of local contexts. By contrast, cosmolocal communities adapt global designs to specific conditions (e.g. soil, climate, available materials, cultural practices), then contribute these adaptations back to global

commons, creating recursive iterative improvement cycles (Kostakis et al., 2015, 2024). This reconfiguration (Figure 1) enables what conventional industrial organization cannot: communities access cutting-edge technical knowledge without ceding production control to distant corporations or becoming dependent on global supply chains for essential goods. Section 4 documents how this operates in practice across agriculture, energy, and healthcare.**Figure 1**. An overview of the cosmolocalism structural framework with its functions (e.g. knowledge transfer), spatial dimensions (e.g. urban, rural), and main fields of activity (e.g. energy, agriculture). Credits: Kostakis et al. (2023, p. 2318).



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The figure shows a conceptual illustration of the cosmolocalism structural framework described by Kostakis et al. (2023). At the center, a large circle represents the digital commons of Design, Knowledge and Software, representing shared online resources. Around this center there are local production hubs in urban and rural areas that draw on and contribute to the shared digital

commons.

Cosmolocalism draws on three theoretical traditions: commons theory (Ostrom, 1990), peer production research (Benkler, 2006), and appropriate technology (Schumacher, 1973). It departs from each in instructive ways. Knowledge commons are non-rival – sharing designs enriches rather than depletes collective pools – but whereas conventional peer production remains concentrated in digital domains, cosmolocalism extends collaborative dynamics into material production (Giotitsas, 2019). And whereas appropriate technology movements sometimes romanticized local isolation, cosmolocalism maintains active global knowledge exchange. This combination of local manufacturing and open global knowledge flows creates contexts for 'technology sovereignty': the capacity of communities to determine their own technological trajectories rather than accepting industrial determinations (Giotitsas, 2019).

A cosmolocal configuration of EU industrial policy should therefore prioritize strategically positioning industry within global knowledge exchanges. In contemporary geoeconomic conditions, actors isolated from global knowledge circulation risk technological marginalization. European industrial policy should thus be refined by shaping the terms under which such flows occur, while strengthening territorially embedded production capacities.

3. Scope and limitations: strategic rebalancing, not universal solution

Cosmolocalism's transformative potential must be understood within realistic boundaries. It appears well-suited to low-volume, modular, repairable, locally adaptable products – agricultural tools, medical equipment, assistive devices, small-scale energy infrastructure – but proves less applicable to mass-produced, capital-intensive goods requiring economies of scale. For example, there are no precedents of cosmolocal production in heavy industries like

petrochemical refineries, or in sectors where high R&D costs create natural monopolies. Structural changes like worker ownership and taxing high returns to capital (Kallis et al., 2025) and policy reforms like green economic planning (Bärnthaler et al., 2025) are necessary for these sectors' post-growth approach. The above limitations of cosmolocalism suggest that today its role in transforming industrial policies is partial and context-dependent. In this sense, cosmolocalism is a component within a broader post-growth transformation architecture, contributing to the gradual and plural operationalization of the framework proposed by Bärnthaler et al. (2025), rather than a substitute for comprehensive institutional reform.

Significant challenges remain. Whether cosmolocal initiatives can meet mass-market demand or remain niche remains unclear. Without robust multi-scale coordination mechanisms, local nodes lack capacity to scale production adequately (Kostakis et al., 2018). Cosmolocalism, as a mode of commons-based peer production, depends on communities that include contributors and volunteers. Reliance on volunteer labour risks long-term instability that may force projects towards conventional business models, threatening commons-based integrity. Successful cosmolocal manufacturing requires design literacy and fabrication facility access, demanding systematic capacity building through education, training, and infrastructure investment (Kostakis et al., 2018). Further, a persistent contradiction exists between local autonomy and global coordination (Kostakis et al., 2023), generating governance tensions.

Cosmolocalism also faces diffusion challenges inherent to grassroots innovations: 'Paradoxically, a key benefit of grassroots innovations, namely, the "world within a world", undermines diffusion. Whilst practices where "the rules are different" have certain strengths, those strengths become barriers when in concerted opposition to incumbent regimes' (Seyfang & Smith, 2007, p. 597). These challenges demand strategic intervention rather than dismissal, indicating necessary supporting conditions, which should

become central elements of the EU industrial policy: reformed intellectual property regimes, procurement frameworks favouring cosmolocal production, makerspace investment (particularly in peripheral regions), design literacy and commons governance capacity building, and piloted cosmolocal approaches in essential sectors. Cultivating durable synergies amongst prefigurative forces creating new economies and finding political expressions for them to act in alliance with other emancipatory forces proves crucial in scaling-out cosmolocalism. In the context of European industrial policy, these conditions prerequest a radical transformation to create stable institutional bridges between makerspaces, platform cooperatives, solidarity economy actors, and public authorities.

4. Operationalizing post-growth industrial policy: resolving contradictions through cosmolocalism

Having established the cosmolocal framework and its boundaries, we now demonstrate how this reconfiguration of knowledge and material flows can contribute to operationalizing Bärnthaler et al.'s (2025) three post-growth pillars. Table 1 maps each pillar to the specific EU policy contradiction it addresses, the cosmolocal mechanism through which it operates, and indicative policy instruments that could support implementation. The subsections that follow elaborate on each pathway with evidence from existing cosmolocal initiatives.**Table 1**. Mapping cosmolocal mechanisms onto the three pillars of Bärnthaler et al.'s (2025) post-growth industrial policy framework. (Table view)

Post-growth pillar	EU contradiction	Cosmolocal mechanism	Indicative policy instruments
Foundational Liveability *(Innovation without*	Neglect of foundational sectors in favour of export-driven	Knowledge circulates as global commons while	1. Preferential public procurement scoring for bids

monopoly)	industries; corporate monopoly over essential goods and services.	communities retain control over essential production. Needs-centred design: communities determine which goods are produced. Cost reductions through open-source hardware.	demonstrating commons-based, locally produced foundational goods.
2. Public investment in makerspaces and design-literacy programmes in foundational sectors.			
Peaceful Planetary Co-Existence *(Productive capacity without resource imperialism)*	Strategic Autonomy deepens resource dependencies and eco-imperialist tensions; CRMA anticipates expanded extraction frontiers for critical raw materials.	Design-embedded sustainability: modularity, on-demand local manufacturing, shared productive infrastructure. Use of locally available, low-cost materials reduces critical mineral dependencies and transport emissions.	1. Reformed IP regimes requiring open-source licensing for publicly funded hardware R&D
2. Reciprocal			

knowledge-sharing agreements with Global South partners, anchored in open-source technology transfers rather than resource extraction			
Democratically Coordinated Sustainability *(Coordination without centralization)*	Reliance on private profitability and market governance; absence of exnovation mechanisms for carbon-intensive industries; unconditional corporate welfare.	Polycentric, commons-based governance enabling multi-scale coordination from local to societal levels. Communities select technologies based on needs and values rather than market profitability. Distributed decision-making preserves democratic agency across scales.	1. Partner-state policies removing institutional barriers to commons-based production.
2. Conditional public funding and state support tied to open-design, commons-governance, and			

exnovation
criteria.

4.1. Foundational liveability: innovation without monopoly

Current EU industrial policy prioritizes 'European Champions' and export-driven industries, hence, neglecting foundational sectors (care, food, housing, transport), where the average European worker is more likely employed (Bärnthaler et al., 2025). This perpetuates dependencies on proprietary technologies and corporate monopolies for essential goods and services. Corporate monopolies are often considered as flag-bearers of technological innovation, but 'while innovation is vital, if its benefits do not translate into secure, high-quality jobs and improved public services, it risks deepening inequalities and fuelling political backlash' (Bärnthaler et al., 2025, p. 12).

Cosmolocalism addresses this by enabling innovation without monopoly control: knowledge circulates as commons while communities maintain control over essential production. Cosmolocal innovation practices are both present and cost-effective. Heikkinen et al. (2020) demonstrate that science funders could achieve 90% cost savings through free and open-source hardware compared to proprietary alternatives, while Svensson and Hartmann (2018) document 10-fold returns on investment from community-controlled innovations in Swedish healthcare makerspaces.

The needs-centred approach Bärnthaler et al. propose – differentiating 'foundational reliance systems (for daily essentials), lifestyle and comfort support systems (for occasional goods and services), and tradeable serving systems (for inputs)' (p. 9) – finds direct operational expression in cosmolocal agricultural tool production. L'Atelier Paysan,[1] formalized as a French cooperative in 2014, operates through participatory design where farmers directly shape which tools address foundational needs (Giotitsas, 2019).

Rather than accepting agro-industrial technology reinforcing farmer dependency through expensive proprietary equipment, the cooperative has developed over 20 collectively validated open-source designs using standardized parts available at any hardware store. Through numerous training workshops, the cooperative has trained a large number of farmers in metalworking skills, directly strengthening foundational reliance systems through community capacity-building.

When Greek farmers sought to adapt these designs, direct replication proved impossible due to different soil conditions, plant varieties, and topography demanding context-specific adaptations (Kostakis et al., 2023). Designs functioned as global knowledge commons, but actual tools emerged from local fabrication responding to place-based requirements. Farm Hack,[2] a US-based network initiated around 2010, demonstrates similar dynamics at larger scale (Giotitsas, 2019). Within three years, it attracted thousands of active participants contributing tens of thousands of hours to collaborative agricultural knowledge repositories (Giotitsas, 2019).

Additionally, Wind Empowerment[3] demonstrates similar dynamics in energy infrastructure. Operating since 2011 across 73 member organizations in 43 countries, WE addresses rural electrification – a foundational reliance system – through locally manufactured small wind turbines based on crafts practiced in rural settings (Kostakis et al., in review). Case studies from Ethiopia and Nepal illustrate the cosmolocal mechanism in practice (Latoufis et al., 2018; Troullaki et al., 2022). In both contexts, Wind Empowerment members worked with local organizations to navigate regulatory environments, source regionally available materials, and adapt turbine designs to local wind conditions. The turbines are manufactured based on crafts practiced in rural settings, requiring only basic tools and traditional craft skills rather than specialized factories. Communities thus access sophisticated wind turbine designs through global commons while manufacturing

and implementation remain under local control. This approach directly challenges conventional renewable energy deployment where communities depend on expensive imported technologies maintained by outside experts, creating the capacity for communities to control their energy infrastructure over time.

These initiatives contribute to operationalizing Foundational Liveability in three ways. First, by prioritizing the production of foundational goods over luxury or tradeable goods; as the product is decided upon the needs of the community. Second, they reduce cost burdens: L'Atelier Paysan explicitly positions against debt-inducing mechanization, while Farm Hack remanufactures 'extinct' equipment like farm-scale oat hullers, providing small farmers access to essential processing infrastructure otherwise unavailable. Third, they build technology sovereignty. Innovation thus occurs rapidly through global knowledge commons without corporate monopolies controlling essential productive infrastructure, addressing certain aspects of Bärnthaler et al.'s vision of strengthened foundational reliance systems.

4.2. Peaceful planetary co-existence: productive capacity without resource imperialism

Current EU industrial policy's Strategic Autonomy pillar creates eco-imperialist tensions, accelerating nature expropriation through 'capitalist value chains' (Selwyn, 2026) while neglecting environmental impacts and contributing to world destabilization. The CRMA anticipates increased critical raw material consumption requiring extensive extraction frontier expansion within and beyond the EU (Bärnthaler et al., 2025), perpetuating resource conflicts while claiming to seek autonomy.

Life cycle assessments provide empirical evidence for the sustainability potential of cosmolocal production. Troullaki et al. (2022) compared five small wind turbine life cycles, from conventional industrial production to open-source local

manufacturing. Cosmolocal approaches outperformed all alternatives across technical, environmental, and social criteria while remaining economically competitive. Distributed manufacturing achieves significant reductions in global warming potential, acidification, and eutrophication through eliminated transportation emissions and reduced material waste (Cerdas et al., 2017). Given that industrial emissions have nearly doubled since 1990 (UNIDO, 2025), distributed production offers dramatic reductions through eliminated long-distance shipping and localized supply chains. From open-source renewables (Kostakis et al., in review) to pandemic face shields (Pazaitis et al., 2020) to prosthetics (Kostakis & Dalakoglou, 2025), cosmolocal initiatives use off-the-shelf, low-cost materials from local hardware stores, with some versions eliminating electronics entirely to reduce mineral dependencies. This directly addresses the CRMA's problematic extraction frontier expansion, demonstrating how cosmolocal production reduces overproduction while increasing product lifespan and lowering material and energy use.

The sufficiency strategy Bärnthaler et al. propose as crucial for reducing 'overall resource use as a key element of industrial policy' (p. 13) finds concrete expression in cosmolocalism's design principles: 'design-embedded sustainability, i.e. products designed to last for as long as possible; on-demand manufacturing, i.e. materials tend to travel less; and optimization of infrastructures, i.e. digital and physical productive infrastructures are shared' (Kostakis et al., 2023, p. 2311). Cosmolocal production takes advantage of modularity enabling component replacement rather than complete product replacement. For example, users can replace individual prosthetic fingers for $10-20 rather than purchasing entirely new devices (Kostakis & Dalakoglou, 2025).

Cosmolocalism could prove crucial for European industry viability in this era of declining Western hegemony. As the US intensifies resource imperialism and Global South increasingly reclaims resource sovereignty – with reorientation of traditional

European trading partners to South-South and intra-Brics trade (UN, 2025) – cosmolocal configuration of the EU industrial policy could provide an alternative: To mitigate dependencies on precarious global supply chains by fostering the development of resilient, localized production systems integrated with global common knowledge networks. Peer-to-peer knowledge sharing creates mutual interests between the EU and the Global South. Open-source hardware and software represent unconditional transfers of economic value from Global North to Global South, abandoning the obsolete and unfruitful ideal of western hegemony. Recent research demonstrates how open-source friendly policies foster energy efficiency in the Global South (Faez et al., 2025) and reconcile technological advancement with social justice in circular economies (Kostakis & Dalakoglou, 2025). This exemplifies Bärnthaler et al.'s vision of 'Peaceful Planetary Co-Existence' based on 'a multipolar, regionalized geopolitical framework' respecting local autonomy and enabling knowledge sharing, offering practical pathways beyond eco-imperialist tensions.

4.3. Democratically coordinated sustainability: coordination without centralization

Current EU industrial policy's Competitive Sustainability pillar relies on private profitability, market governance, and technological innovation, creating structural barriers to rapid green transition. It lacks 'mechanisms of exnovation, i.e. the purposive termination of unsustainable infrastructures, technologies, products, and practices' (Bärnthaler et al., 2025, p. 8). By supporting locally-controlled over centralized production, cosmolocalism prioritizes the social-ecological needs of local communities over profit-driven obsolescence.

Nardelli and Santaella-Goncalves (2025) demonstrate how cyber-physical systems support decentralized planning through polycentric commons-based governance, enabling multi-scale coordination from

local to societal levels while prioritizing environmental sustainability and voluntary participation over compulsory labour. Cosmolocal initiatives promote a reinvigorated common(s) sense in multiple nodes worldwide, contributing to new cosmopolitanisation processes potentially producing transformative praxes (Hosseini et al., 2017; Kostakis et al., 2023). Cosmolocal initiatives prefigure democratization in production, providing niches of grassroots precedents for 'democratically coordinated mechanisms to determine what should be produced' (Bärnthaler et al., 2025, p. 11).

Cosmolocal initiatives operate through modular governance structures facilitating coordination without centralized control, where independent member organizations voluntarily engage in governance and project initiatives across global membership (Bauwens et al., 2019; Giotitsas, 2019; Kostakis et al., in review). Such decentralized coordination mechanisms, particularly those employing distributed optimization algorithms for resource allocation, can match supply and demand across various scales while preserving democratic decision-making at all levels (Nardelli & Santaella-Goncalves, 2025). Cosmolocalism thus enables communities to choose appropriate technologies based on local needs and values rather than market profitability, addressing the exnovation deficit. Communities can purposefully reject technologies incompatible with local contexts or sustainability goals and adopt innovations serving collective needs.

Bärnthaler et al. (2025) highlight the 'Derisking State' problem, i.e. current approaches providing '(more or less) unconditional corporate welfare' rather than 'institutional mechanisms that continuously align private capital with strategic public priorities' (p. 14). They propose a broad set of mechanisms (e.g. restrict lending to destructive sectors, expand state ownership in key sectors) for addressing this issue. From a commons' theory perspective, this transition requires a 'partner-state' (Bauwens et al., 2019) approach, meaning that while such mechanisms are necessary, they should have an extra focus on supporting grassroots, commons-based

modes of production (e.g. policies to overcome institutional and market resistances, such as intellectual property regimes, makerspace legal issues, hardware licensing, and corporate appropriation of open designs). Cosmolocalism neither relies on unconditional state support nor requires complete post-capitalist transformation; its examples build towards transformative goals, but compromise with specific capital factions, which aligns with Bärnthaler et al.'s view of Green Economic Planning for a Democratically Coordinated Sustainability.

The relationship between commons-based governance and state-led coordination deserves further scrutiny, however, as it involves genuine tensions rather than seamless complementarity. Bärnthaler et al.'s (2025) vision of Democratically Coordinated Sustainability relies on public institutions with the capacity to plan, regulate, and redirect investment at scale. Such functions that commons governance, by design, distributes across autonomous communities. Three tensions are particularly salient. First, a tension of accountability: state-led planning operates through democratic mandates, electoral accountability, and binding regulation, whereas commons governance relies on voluntary participation and community self-regulation. Scaling cosmolocal production into foundational sectors such as energy and housing will inevitably require interfacing with public authorities whose legitimacy and operating logics differ from those of peer-to-peer communities. Second, a tension of standardization: industrial policy demands interoperability, quality assurance, and safety regulation, while cosmolocalism's strength lies precisely in context-specific adaptation. Ensuring that locally manufactured medical devices or energy infrastructure meet public health and safety standards without re-imposing the proprietary certification regimes that cosmolocal production seeks to circumvent is a non-trivial institutional design challenge. Third, a tension of political economy: as Bärnthaler et al. (2021) demonstrate, reclaiming essential provisioning systems from market logics requires confronting

entrenched corporate interests and restructuring the fiscal and regulatory architecture within which production occurs. Grassroots initiatives alone lack the coercive and redistributive capacity to accomplish this. They can prefigure alternatives but not dismantle incumbent regimes.

These tensions suggest that the partner-state framework (Bauwens et al., 2019) requires further elaboration for the post-growth context. A productive articulation between commons-based and state-led coordination would involve, at minimum, three elements: (a) institutional recognition of cosmolocal production as a legitimate mode of provisioning within public procurement and regulatory frameworks, rather than an informal supplement to market provision; (b) public investment in shared productive infrastructure (makerspaces, fabrication labs, open-source repositories) that communities govern but states co-finance, as Table 1 outlines; and (c) co-designed governance mechanisms that preserve community autonomy over production decisions while enabling democratic oversight of outcomes, particularly where foundational goods are concerned. The cosmolocal initiatives documented in this article suggest that such articulations are already emerging in practice, albeit unevenly and without systematic policy support. The challenge for post-growth industrial policy is to learn from these experiments rather than merely accommodating them.

5. Territorializing transformation: embedding cosmolocalism in European spatial governance

Beyond sectoral policies, cosmolocalism is also related to spatial policies. EU spatial frameworks – the Territorial Agenda 2030 and Urban Agenda for the EU – constitute policy instruments for achieving territorial cohesion through balanced development, yet

face criticism for insufficient responses to spatial imbalances and inequalities (Madanipour et al., 2022). The 9th Cohesion Report, confirms that significant regional disparities remain and risk widening despite cohesion policies (European Commission, 2024).

Cosmolocalism can address spatial imbalances by reducing regional disparities and strengthening least developed areas. Recent cosmolocal initiatives in Epirus, Greece, exemplify this potential. Epirus is a remote EU region with GDP per capita at 45% of the EU average, making it one of Europe's poorest regions (Eurostat, 2025). Nevertheless, a novel cosmolocal ecosystem has emerged, connecting the region internationally, generating employment, and addressing local needs through networks of support, knowledge, and resource sharing. Indicatively, participating initiatives include: The High Mountains,[4] a social cooperative reviving mountainous communities and repopulating isolated villages; Boulouki,[5] an interdisciplinary collective documenting traditional construction techniques and preserving cultural heritage; the Pokari Project,[6] a social cooperative preserving and collaboratively developing traditional weaving technology; Tzoumakers,[7] a rural makerspace producing hardware solutions for small-scale agriculture; Habibi.Works,[8] an intercultural makerspace empowering refugees by promoting education and integration with local populations; Commonen,[9] an energy cooperative for collective electricity self-production that established mainland Greece's first collective self-consumption solar project; and the School of the Earth/Nea Guinea,[10] a key member of the Wind Empowerment network producing open-source renewable energy technologies; Electra Coop,[11] a social cooperative supporting self-producing energy communities; the P2P Lab,[12] a research hub that studies commons-based transformations through participatory action research in the region and beyond. These initiatives propose alternative developmental pathways, maintain international collaborations, and respond to local and regional challenges through grassroots innovative practices (Kostakis et al., 2023; Liodaki & Stockdale,

2025).

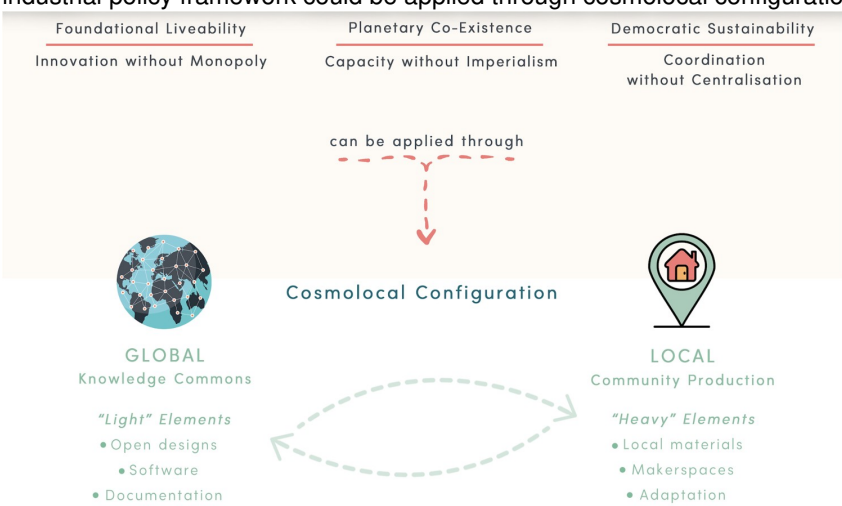
Spatial planning in the EU could adopt cosmolocal approaches through several mechanisms. The Territorial Agenda 2030 could apply cosmolocal rationale to achieve its overarching objectives: a Just and Green Europe. Territorial impact assessments and ESPON[13] reports that inform and assess EU policies could incorporate open-design and distributed manufacturing metrics (e.g. locally produced units from open-source repositories, local value retained, reuse rates of shared manufacturing files). EU directives and state policies could foster land-use instruments prioritizing locally anchored community-based manufacturing ecosystems (e.g. promote zoning exempting community-run micro-industrial uses from typical change-of-use barriers) and offer preferential procurement scoring for bids demonstrating localized production from digital commons.

6. Conclusion

The EU stands at a critical juncture. Caught between USA-led technological dependency and BRICS industrial momentum, EU industrial policy resembles reactive scrambling rather than coherent transformation. Resources continue flowing towards large industrial alliances and Big Tech at the expense of initiatives that democratize technology and enhance territorial resilience. Current policy remains trapped in contradictions: seeking resilience, autonomy, and sustainability while maintaining structural dependencies on endless growth, which is the very driver of ecological overshoot and geopolitical conflicts it claims to address. Post-growth research proposes transformative alternatives through Foundational Liveability, Peaceful Planetary Co-Existence, and Democratically Coordinated Sustainability, yet faces the critical challenge of operationalization.

This article has argued that cosmolocalism could be a critical part of meeting that challenge. By reconfiguring knowledge and material flows at different scales – designs circulating globally

through digital commons, manufacturing occurring locally using appropriate technologies and materials – cosmolocalism provides concrete mechanisms for transforming foundational goods provisioning without perpetuating the growth dependencies, monopoly control, and eco-imperialist tensions that current policy entrenches (Figure 2). Preliminary empirical evidence from agricultural tools, small-scale energy, and healthcare reveals both the potential and the boundaries of this approach: substantial cost savings, environmental gains, and needs-driven innovation, but also questions of scalability, volunteer labour sustainability, and required technical competencies. Cosmolocalism proves most applicable to modular, repairable, locally adaptable foundational goods; capital-intensive manufacturing requiring economies of scale needs complementary approaches.**Figure 2**. Bärnthaler et al.'s (2025) post-growth industrial policy framework could be applied through cosmolocal configuration.



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The figure shows a conceptual infographic diagram illustrating the application of post-growth industrial policy framework through cosmolocal configuration. At the top, there are the three pillars of post-growth industrial policy framework: Foundational Liveability, Planetary Co Existence, and Democratic Sustainability. Under each pillar there is a cosmolocal approach for achieving it: Innovation

without Monopoly, Capacity without Imperialism, and Coordination without Centralisation. Cosmological Configuration is described by its global and local elements. On the left side a globe filled with a network of dots and connecting lines represents the global circulation of the Knowledge Commons. They are the Light Elements of Open designs, Software, and Documentation. On the right side, a location pin icon that encloses a small house symbol represents the local community production. The Heavy Elements (Local materials, Makerspaces, and Adaptation) remain at the local level. Between the globe and the location pin, a large dashed double headed arrow indicates the two way movement between the global and local elements.

Perhaps the most consequential open question concerns the relationship between commons-based self-governance and state-led democratic coordination. Operationalizing post-growth industrial policy requires not only grassroots alternatives but also institutional architectures that recognize, support, and learn from commons-based provisioning without domesticating it. The tensions of accountability, standardization, and political economy that emerge when cosmolocal practices interface with public policy frameworks cannot be wished away; they must be designed through. Further research should investigate how partner-state models can be concretely configured to address these tensions, drawing on the experiments already underway in contexts such as the Epirus ecosystem in Greece.

Realizing cosmolocalism's potential requires strategic intervention: reforming intellectual property regimes and procurement frameworks; investing in makerspaces, particularly in peripheral regions; building design literacy and commons governance competencies; piloting cosmolocal approaches in essential sectors; and shifting to Global South partnerships based on reciprocal knowledge sharing rather than resource extraction. The question is not whether alternatives to growth-dependent industrialism are possible, but whether European institutions will

support these alternatives before current contradictions become irreversible crises. The infrastructure exists, knowledge commons are growing, communities are organizing. What remains is political will to embrace operational mechanisms that resolve contradictions rather than perpetuate them. Cosmolocalism offers not utopian promise but existing pathways.

Notes

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Sections

1. Abstract
2. 1. Introduction
3. 2. The cosmolocal reconfiguration
4. 3. Scope and limitations: strategic rebalancing, not universal solution
5. 4. Operationalizing post-growth industrial policy: resolving contradictions through cosmolocalism
    1. 4.1. Foundational liveability: innovation without monopoly
    2. 4.2. Peaceful planetary co-existence: productive capacity without resource imperialism
    3. 4.3. Democratically coordinated sustainability: coordination without centralization
6. 5. Territorializing transformation: embedding cosmolocalism in European spatial governance
7. 6. Conclusion
8. Notes
9. Disclosure statement
10. Funding
11. Notes on contributors
12. References

Guide

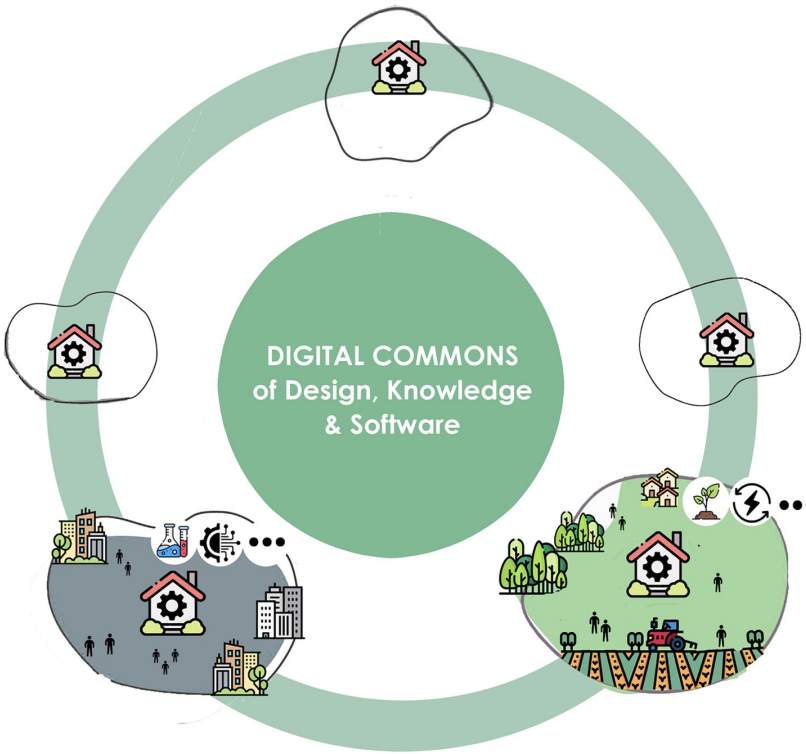
1. List of Sections
2. List of Illustrations
3. Frontmatter

4. Abstract
5. Keywords
6. Bodymatter
7. Backmatter
8. Notes
9. References

List of Illustrations

1. Figure 1
2. Figure 2

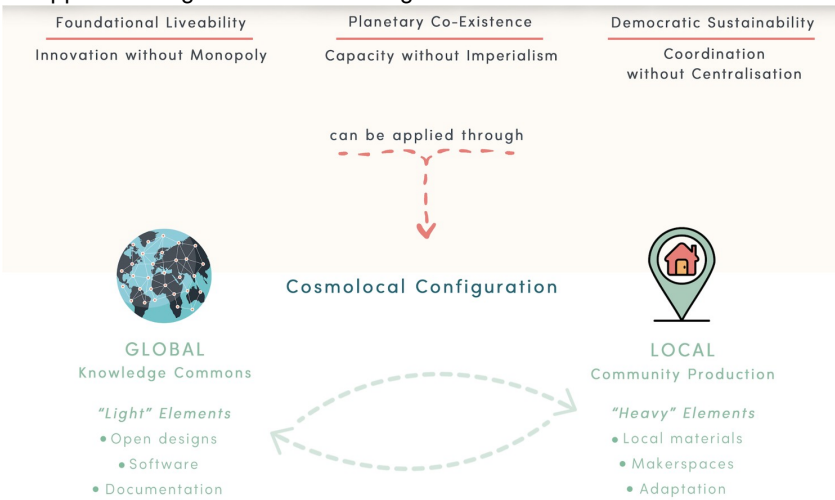
Figure 1. An overview of the cosmolocalism structural framework with its functions (e.g. knowledge transfer), spatial dimensions (e.g. urban, rural), and main fields of activity (e.g. energy, agriculture). Credits: Kostakis et al. (2023, p. 2318).



View detailed description

The figure shows a conceptual illustration of the cosmolocalism structural framework described by Kostakis et al. (2023). At the center, a large circle represents the digital commons of Design, Knowledge and Software, representing shared online resources. Around this center there are local production hubs in urban and rural areas that draw on and contribute to the shared digital commons.

Figure 2. Bärnthaler et al.'s (2025) post-growth industrial policy framework could be applied through cosmolocal configuration.



View detailed description

The figure shows a conceptual infographic diagram illustrating the application of post-growth industrial policy framework through cosmolocal configuration. At the top, there are the three pillars of post-growth industrial policy framework: Foundational Liveability, Planetary Co Existence, and Democratic Sustainability. Under each pillar there is a cosmolocal approach for achieving it: Innovation without Monopoly, Capacity without Imperialism, and Coordination without Centralisation. Cosmological Configuration is described by its global and local elements. On the left side a globe filled with a network of dots and connecting lines represents the global circulation of the Knowledge Commons. They are the Light Elements of Open designs, Software, and Documentation. On the right side, a location pin icon that encloses a small house symbol represents the local community production. The Heavy Elements (Local materials, Makerspaces, and Adaptation) remain at the local level. Between the globe and the location pin, a large dashed double headed arrow indicates the two way movement between the global and local elements.

Table 1. Mapping cosmolocal mechanisms onto the three pillars of Bärnthaler et al.'s (2025) post-growth industrial policy framework.

Post-growth pillar	EU contradiction	Cosmolocal mechanism	Indicative policy instruments
Foundational Liveability *(Innovation without monopoly)*	Neglect of foundational sectors in favour of export-driven industries; corporate monopoly over essential goods and services.	Knowledge circulates as global commons while communities retain control over essential production. Needs-centred design: communities determine which goods are produced. Cost reductions through open-source hardware.	1. Preferential public procurement scoring for bids demonstrating commons-based, locally produced foundational goods.
			2. Public investment in makerspaces and design-literacy programmes in foundational sectors.
Peaceful Planetary Co-Existence *(Productive capacity without resource imperialism)*	Strategic Autonomy deepens resource dependencies and eco-imperialist tensions; CRMA anticipates expanded	Design-embedded sustainability: modularity, on-demand local manufacturing, shared productive infrastructure. Use of locally	1. Reformed IP regimes requiring open-source licensing for publicly funded hardware R&D

	extraction frontiers for critical raw materials.	available, low-cost materials reduces critical mineral dependencies and transport emissions.	
2. Reciprocal knowledge-sharing agreements with Global South partners, anchored in open-source technology transfers rather than resource extraction			
Democratically Coordinated Sustainability *(Coordination without centralization)*	Reliance on private profitability and market governance; absence of exnovation mechanisms for carbon-intensive industries; unconditional corporate welfare.	Polycentric, commons-based governance enabling multi-scale coordination from local to societal levels. Communities select technologies based on needs and values rather than market profitability. Distributed decision-making preserves democratic agency across	1. Partner-state policies removing institutional barriers to commons-based production.

	scales.
2. Conditional public funding and state support tied to open-design, commons-governance, and exnovation criteria.	